

## CLAIMS

What is claimed is:

- 1 1. An apparatus comprising:
  - 2 an input to a microchannel cooling subsystem to receive a fluid flow;
  - 3 a pumping mechanism coupled to said input of said microchannel
  - 4 cooling subsystem to provide said fluid flow, and to cause a turbulence in
  - 5 the fluid flow inside said microchannel cooling subsystem to clear a vapor
  - 6 lock in the fluid flow inside said microchannel cooling subsystem.
- 1 2. The apparatus of claim 1, wherein the pumping mechanism  
2 comprises a pump and a bubble generator with said pump coupled to said  
3 input of the microchannel cooling subsystem to provide said fluid flow at a  
4 first pressure level, and said bubble generator coupled to said input of said  
5 microchannel cooling subsystem to cause said turbulence in the provided  
6 fluid flow inside said liquid to said microchannel cooling subsystem.
- 1 3. The apparatus of claim 2, wherein said pump is selected from a  
2 group consisting of an electrokinetic (ek) pump, a vane pump, a piston pump  
3 and a diaphragm pump.
- 1 4. The apparatus of claim 2, wherein said bubble generator is adapted  
2 to generate one or more bubbles during a period of time sufficient to cause  
3 the pressure of said provided fluid flow to increase from said first pressure  
4 level to a second pressure level for said period of time to cause said  
5 turbulence in said provided fluid flow inside said microchannel cooling  
6 subsystem.
- 1 5. The apparatus of claim 4, wherein said bubble generator further  
2 comprises a chamber to contain a second fluid, an input port to receive said

3 second fluid, an output port coupled to the input of said microchannel  
4 cooling subsystem to output said second fluid for said microchannel cooling  
5 subsystem, and a heater to heat said second fluid, changing a volume of  
6 said second fluid from a fluid state to a gas state within said period of time,  
7 to cause said turbulence in said provided fluid flow inside said microchannel  
8 cooling subsystem.

1 6. The apparatus of claim 5, wherein said input port of said bubble  
2 generator is coupled to said pump, and said second fluid is a diverted  
3 portion of the provided fluid flow.

1 7. The apparatus of claim 5, wherein said heater is activated by an  
2 active feedback controller.

1 8. The apparatus of claim 1, wherein the said microchannel cooling  
2 subsystem comprises a cold plate having a microchannel.

1 9. The apparatus of claim 1, wherein the apparatus further comprises  
2 said microchannel cooling subsystem, including a plurality of microchannels.

1 10. The apparatus of claim 1, wherein the apparatus further comprises  
2 said microchannel cooling subsystem; and  
3 a microelectronic die thermally coupled to said microchannel cooling  
4 subsystem, to be cooled by the microchannel cooling subsystem.

1 11. The apparatus of claim 10, wherein the microelectronic die is a  
2 microprocessor.

1 12. A method comprising

2       suppling a microchannel cooling subsystem with a fluid flow at a first  
3    pressure; and

4       cooling subsystem to clear a vapor lock in said provided fluid flow  
5    inside said microchannel cooling subsystem..

1   13.   The method of claim 12, wherein said causing comprises causing the  
2    pressure of the fluid flow to change for a period of time.

1   14.   The method of claim 13, wherein said causing of the pressure change  
2    comprises generating one or more bubbles in a second fluid to be combined  
3    with the provided fluid flow, during said period of time.

1   15.   The method of claim 14, wherein said generating comprises heating  
2    the second fluid.

1   16.   The method of claim 15, wherein the second fluid is a diverted portion  
2    of the provided fluid flow, and the method further comprises diverting the  
3    provided fluid flow.

1   17.   A system comprising:

2       an IC package including a microchannel cooling subsystem adapted  
3    to receive a fluid flow;

4       a pumping mechanism coupled to said microchannel cooling  
5    subsystem of said IC package to cause a turbulence in said provided fluid  
6    flow inside said microchannel cooling subsystem to clear a vapor lock in  
7    said provided fluid flow inside said microchannel cooling subsystem; and  
8       a networking interface coupled to the IC package.

1   18.   The system of claim 17, wherein the pumping mechanism comprises  
2    a pump and a bubble generator, with said pump coupled to the

3 microchannel cooling system to provide said fluid flow at a first pressure  
4 level, and said bubble generator coupled to the microchannel cooling  
5 system to cause said turbulence in the provided fluid flow inside said  
6 microchannel cooling subsystem.

1 19. The system of claim 18, wherein said pump is selected from a group  
2 consisting of a vane pump, a piston pump and a diaphragm pump.

1 20. The system of claim 18, wherein said bubble generator is adapted to  
2 generate one or more bubbles during a period of time to cause the pressure  
3 of said provided fluid flow to increase from said first pressure level to a  
4 second pressure level for said period of time to cause said turbulence in  
5 said provided fluid flow inside said microchannel cooling subsystem.

1 21. The system of claim 18, wherein said bubble generator comprises a  
2 chamber to contain a second fluid, an input port to receive said second fluid,  
3 an output port coupled to the microchannel subsystem to output said second  
4 fluid, and a heater to heat said second fluid, changing a volume of said  
5 second fluid from a fluid state to a gas state within said period of time, to  
6 cause said turbulence in said provided fluid flow inside said microchannel  
7 cooling subsystem.

1 22. The system of claim 21, wherein said input port of said bubble  
2 generator is coupled to said pump, and said second fluid is a diverted  
3 portion of the provided fluid flow.

4 23. The system of claim 22, wherein said heater is activated by an active  
5 feedback controller.

- 1    24.    The system of claim 17, wherein the said microchannel cooling
- 2    subsystem comprises a cold plate having a microchannel.
  
- 1    25.    The system of claim 17, wherein said microchannel cooling
- 2    subsystem includes a plurality of microchannels.
  
- 1    26.    The system of claim 17, wherein the system is selected from a group
- 2    consisting of a set-top box, a DVD player and a server